


FORM-PTO-1390 (Rev. 12-29-99)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			032326-170
			U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.51) Unassigned 09/807885
INTERNATIONAL APPLICATION NO. PCT/FR00/01263	INTERNATIONAL FILING DATE 11 May 2000	PRIORITY DATE CLAIMED 12 May 1999	
TITLE OF INVENTION METHOD FOR PRODUCING A CONTACTLESS CARD			
APPLICANT(S) FOR DO/EO/US Pierre BERTRAND			
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1). <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). <input checked="" type="checkbox"/> has been transmitted by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> have been transmitted by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input checked="" type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). <input checked="" type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). <p>Items 11. to 16. below concern other document(s) or information included:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. <input type="checkbox"/> A substitute specification. <input type="checkbox"/> A change of power of attorney and/or address letter. <input type="checkbox"/> Other items or information: 			

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.50) 09/807885		INTERNATIONAL APPLICATION NO. PCT/FR00/01263		ATTORNEY'S DOCKET NUMBER 032326-170	
17. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1,040.00 (960) International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 (970) International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 (958) International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 (956) International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 (962) ENTER APPROPRIATE BASIC FEE AMOUNT =				\$ 890.00	
Surcharge of \$130.00 (154) for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492(e)). 20 <input type="checkbox"/> 30 <input type="checkbox"/>				\$	
Claims	Number Filed	Number Extra	Rate		
Total Claims	14 -20 =	-0-	X\$18.00 (966)	\$ -0-	
Independent Claims	2 -3 =	-0-	X\$84.00 (964)	\$ -0-	
Multiple dependent claim(s) (if applicable)			+ \$280.00 (968)	\$ -0-	
TOTAL OF ABOVE CALCULATIONS =				\$ 890.00	
Reduction for 1/2 for filing by small entity, if applicable (see below).				\$ -0-	
SUBTOTAL =				\$ 890.00	
Processing fee of \$130.00 (156) for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492(f)). 20 <input type="checkbox"/> 30 <input type="checkbox"/>				\$ -0-	
TOTAL NATIONAL FEE =				\$ -0-	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 (581) per property +				\$ -0-	
TOTAL FEES ENCLOSED =				\$ 890.00	
				Amount to be:	
				refunded \$	
				charged \$	
a. <input type="checkbox"/> Small entity status is hereby claimed. b. <input checked="" type="checkbox"/> A check in the amount of \$ <u>890.00</u> to cover the above fees is enclosed. c. <input type="checkbox"/> Please charge my Deposit Account No. <u>02-4800</u> in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. d. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>02-4800</u> . A duplicate copy of this sheet is enclosed. NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status. SEND ALL CORRESPONDENCE TO: James A. LaBarre BURNS, DOANE, SWECKER & MATHIS, L.L.P. P.O. Box 1404 Alexandria, Virginia 22313-1404 (703) 836-6620 <div style="text-align: right; margin-top: 20px;"> _____ SIGNATURE James A. LaBarre _____ NAME <u>28,632</u> _____ REGISTRATION NUMBER</div>					

09807885 071202
JC12 Rec'd PCT/PTO 13 NOV 2001
09/807885

Patent
Attorney's Docket No. 032326-170

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)	
)	
Pierre BERTRAND)	Group Art Unit: Unassigned
)	
Application No.: Unassigned)	Examiner: Unassigned
)	
Filed: November 13, 2001)	
)	
For: METHOD FOR PRODUCING A)	
CONTACTLESS CARD)	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination and the calculation of filing fees, kindly amend the above-identified application as follows:

IN THE SPECIFICATION:

Page 1, immediately following the title appearing on line 1, insert the following:

--This disclosure is based upon French Application No. 99/06535, filed on May 12, 1999 and International Application No. PCT/FR00/01263, filed May 11, 2000, which was published on November 23, 2000 in a language other than English, the contents of which are incorporated herein by reference.

Background of the Invention--

Page 2, before line 12, insert the following heading:

--**Summary of the Invention**--

Page 5, between lines 7 and 8, insert the following heading:

--**Brief Description of the Drawings**--

Page 5, before line 23, insert the following heading:

--**Description of the Invention**--

Add the following Abstract:

--A method for producing a contactless card having a support for the functional elements of the card. The support is provided with lower and upper covering layers, and the functional elements borne thereon are formed by means of extrusion, directly in contact with the support.--

IN THE CLAIMS:

Cancel claim 13.

Kindly replace claims 1-12 and 14, as follows.

1. (Amended) A method of manufacturing integrated circuit media of the contactless type that has functional elements comprising an electronic chip connected to a winding that functions as an antenna, and a body comprising a covering layer on at least one side of said functional elements, said method comprising the steps of providing said

functional elements on a support sheet, and extruding said covering layer immediately in contact with said support sheet.

2. (Amended) A method according to Claim 1, wherein said support sheet is a conductive grille in which said winding is formed.

3. (Amended) A method according to Claim 1 wherein said extruding step comprises passing said support sheet containing said functional elements through a die for extruding said covering layer.

4. (Amended) A method according to Claim 3, wherein said support sheet, provided with said functional elements, is packaged in the form of a coil to be unwound continuously during the extrusion step.

5. (Amended) A method according to Claim 4, further including the step, following the extrusion step and after cooling, of cutting said media to the final format for products to be obtained while said support sheet is moving along a manufacturing line.

6. (Amended) A method according to Claim 5, wherein the step of cutting the products to the final format includes a prior positioning phase that includes detection of said functional means through the covering layer material.

7. (Amended) A method according to Claim 4 further including the step, following the extrusion step, of depositing a printed film on the front and/or rear face of the products to be obtained while said support sheet is moving along a manufacturing line.

8. (Amended) A method according to claim 3 wherein said support sheet comprises a film of dielectric material.

9. (Amended) A method according to Claim 8, wherein said covering layer comprises bottom and top layers for covering the dielectric film, which forms a central core between the two layers, and wherein said central core has one or more openings so that said bottom and top layers are coextruded whilst being joined to each other in a monolithic fashion.

10. (Amended) A method according to Claim 8 further including the step, prior to the step of extruding the layers, of producing a winding with antenna and supply coil functions for the chip by metallisation on the dielectric material.

11. (Amended) A method according to Claim 10, wherein the chip is bonded to said dielectric film, and its contacts are connected to two wires for connection to said winding, and the entirety of the chip and its connection wires are embedded in a drop of resin.

12. (Amended) A method according to Claim 11, wherein the two operations of producing the winding and of mounting the chip are carried out continuously on a film packaged as a coil to be unwound continuously during said extrusion.

14. (Amended) An integrated circuit medium of the contactless type, having a central sheet for supporting functional elements, and bottom and top layers, wherein said support sheet has at least one opening through which the bottom and top layers communicate, the material of the bottom and top layers having, with the material situated in said opening, at least a homogeneous molecular continuity constituting one and the same material, said bottom and top layers being obtained by extrusion.

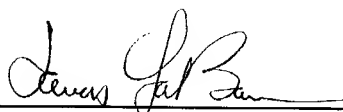
Application No. Unassigned
Attorney's Docket No. 032326-170
Page 6

REMARKS

Entry of the foregoing amendment is respectfully requested. This amendment is intended to place the claims in a more conventional format and eliminate the multiple dependency of the claims.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: 
James A. LaBarre
Registration No. 28,632

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: November 13, 2001

Attachment to Preliminary Amendment dated November 13, 2001

Marked-up Claims 1-12 and 14

1. (Amended) A method of manufacturing integrated circuit media of the contactless type[, such as contactless smart cards, provided with] that has functional elements comprising an electronic [unit (5)] chip connected to a winding [(6) with] that functions as an antenna [function], and [whose body comprises] a body comprising a covering layer on at least one side of [the] said functional elements, [characterised in that the] said method comprising the steps of providing said functional [means (5, 6) are located] elements on a support sheet, and [in that the] extruding said covering layer [at least is formed by extrusion,] immediately in contact with [the] said support sheet.

2. (Amended) A method according to Claim 1, [characterised in that the] wherein said support sheet is a conductive grille in which [the] said winding [(6)] is formed.

3. (Amended) A method according to Claim 1 [or 2, characterised in that it is implemented by making the] wherein said extruding step comprises passing said support sheet[, provided in advance with the] containing said functional [means (5, 6), pass] elements through a die [(F)] for extruding [the] said covering layer [(2 and/or 3)].

4. (Amended) A method according to Claim 3, [characterised in that the] wherein said support sheet, provided with [the] said functional elements [(5, 6)], is

Attachment to Preliminary Amendment dated November 13, 2001

Marked-up Claims 1-12 and 14

packaged in the form of a coil [(B)] to be unwound continuously [with a view to continuous implementation of] during the extrusion step.

5. (Amended) A method according to Claim 4, [characterised in that] further including the step, following the extrusion step and after cooling, [a printing step and/or a step] of cutting said media to the final format for [the] products to be obtained [take place in] while said support sheet is moving along a manufacturing line.

6. (Amended) A method according to Claim 5, [characterised in that it comprises a] wherein the step of cutting the products to the final format [in which there is provided, for the positioning necessary for the cutting proper,] includes a prior [locating] positioning phase [by] that includes detection of [the] said functional means [(5, 6)] through the covering layer material [with which they are covered].

7. (Amended) A method according to [one of Claims 4 to 6, characterised in that,] Claim 4 further including the step, following the extrusion step, [a step takes place in line for the deposition of] of depositing a printed film on the front and/or rear face of the products to be obtained while said support sheet is moving along a manufacturing line.

Attachment to Preliminary Amendment dated November 13, 2001

Marked-up Claims 1-12 and 14

8. (Amended) A method according to [one of Claims 1 and 3 to 7, characterised in that] claim 3 wherein said support sheet comprises a film of dielectric material [(1) is provided as a support sheet for the said functional elements (5, 6)].
9. (Amended) A method according to Claim 8, [characterised in that two] wherein said covering layer comprises bottom [(1)] and top [(2)] layers [are provided] for covering the dielectric film [(1) forming], which forms a central core between the two layers, and [in that there are also provided] wherein said central core has one or more openings [(12) in the said central core of the card,] so that [the] said bottom and top [(2, 3)] layers are coextruded whilst being joined to each other in a monolithic fashion.
10. (Amended) A method according to Claim 8 [or 9, characterised in that,] further including the step, prior to the step of extruding the layers [(2, 3)], of producing a winding [(6)] with antenna and supply coil functions for the chip [(5) is produced] by metallisation on the [core (1)] dielectric material.
11. (Amended) A method according to Claim 10, [characterised in that] wherein the chip [(5)] is bonded to [the] said [central core] dielectric film, and its contacts are connected to two wires [(7)] for connection to [the] said winding [(6)], [the whole] and the

Attachment to Preliminary Amendment dated November 13, 2001

Marked-up Claims 1-12 and 14

entirety of the chip [(5)] and its connection wires [(7) being] are embedded in a drop of resin [(8)].

12. (Amended) A method according to Claim 11, [characterised in that] wherein the two operations of producing the winding [(6)] and of mounting the chip [(5)] are carried out continuously on a film [(10)] packaged as a coil [(B)] to be unwound continuously [and constituting the said central core] during said extrusion.

14. (Amended) An integrated circuit medium of the contactless type, [such as a contactless smart card,] having a central sheet [(1)] for supporting [the] functional [means (5, 6)] elements, and bottom and top layers, [(2, 3), characterised in that the] wherein said support sheet [(1)] has at least one opening [(12)] through which the [two] bottom [(2)] and top [(3)] layers communicate, the material of the bottom and top layers [(2, 3)] having, with the material situated in [the] said opening [(12)], at least a homogeneous molecular continuity constituting one and the same material, [the] said bottom [(2)] and top [(3)] layers being obtained by extrusion.

09/807885

1

2/8/85
A METHOD OF MANUFACTURING A CONTACTLESS CARD

The present invention concerns the manufacture of integrated circuit media of the contactless type such as electronic labels or cards known as "contactless" because of their ability to exchange information at a distance with a reader in accordance with a read mode or a write/read mode.

Such cards are notably identification badges, or smart cards with more extensive functions whose applications are currently multiplying. For example, in such an application known as "remote billing", the card is debited whilst passing close to a terminal and can likewise be recharged at a distance. As a general rule, the data transmission is effected by radio frequency or microwave.

In a known method of manufacturing a contactless card, the so-called "co-lamination" technique is used. It consists here of disposing, between the platens of a press, a stack of thermoplastic sheets in the middle of which the electronic circuit for contactless transmission is positioned; and then welding the different thermoplastic sheets by pressure and raising the temperature. This method makes it possible to obtain a card in which all the electronics are embedded in the plastics material. However, because of the differences between the coefficients of expansion of the various materials used, the combined action of the pressure and temperature causes a residual deformation on the surface of the card. And the remedy for this deformation is a great burden in terms of production, since it consists of substantially extending the cycle times, notably the cooling. Another drawback of these

cards is their mediocre ability to resist repeated bending stresses.

In the document EP-A-0 640 940 in the name of N.V. Nederlandsche Apparentfabriek NEDAP, a solution to this dual problem is proposed according to which an intermediate layer with a support function for the functional means of the card is interposed between two surface layers, each of the latter being fixed to the intermediate layer by a connecting layer with a lower softening temperature. This method has however the disadvantage of including a large number of steps and therefore being fairly complex to implement.

The present invention proceeds from a search for a novel solution to manufacturing integrated circuit media of the contactless type in order to surmount the aforementioned problems, at the same time as satisfying other objectives of automation of the manufacture and mass production at a high rate.

To this end, the invention consists of a method of manufacturing an integrated circuit medium of the contactless type, provided with functional elements comprising an electronic unit or chip connected to a winding with the function of an antenna, and whose body comprises a covering layer on at least one side of the said functional elements, characterised in that the said functional means are located on a support sheet, and in that the said covering layer at least is formed by extrusion, immediately in contact with the said support sheet.

In the preferential case where two covering layers are extruded, one on each side of the said support sheet, there is

therefore obtained a body integrating the electronic components, and for the power supply and transmission of the system, which components are entirely embedded in the said body.

In one embodiment of the invention, the said support sheet for the said functional means is a film of dielectric material. In a variant, it is a grille or section of conductive strip (of the "lead frame" type), from which the said winding can be cut in the form of one or more turns.

According to another characteristic of the invention, the said manufacturing method is implemented by causing the said support sheet, provided in advance with the said functional means, to pass through a die for extruding the said covering layer at least. If two covering layers are provided, they are advantageously produced together by co-extrusion on the two sides of the said support sheet.

In both cases, in a preliminary step of the manufacturing method, the said support sheet, provided with the said functional card elements, is advantageously packaged in the form of a coil to be unwound continuously with a view to a continuous implementation of the extrusion or co-extrusion step, following which, after cooling, there can take place in line a step of printing and/or cutting to the final format, and/or of testing the products, and/or of deposition of printed film, magnetic track or the like on the front and/or reverse side.

According to another characteristic of the invention, the cutting step comprises a prior phase of locating, with a view to positioning for the cutting proper, the locating consisting

of a detection of the said functional means through the material with which they are covered (for example by radio, ultrasound, etc). This way of proceeding is particularly advantageous when provision is made for the said support sheet to be completely embedded in the extruded material.

Where the said support sheet is a film of dielectric material constituting a central core between two coating layers obtained by co-extrusion, one or more openings are advantageously provided in the said central core of the card, so that the said bottom and top layers are co-extruded whilst being joined to each other in a monolithic fashion.

The present invention therefore also concerns an integrated circuit medium of the contactless type, such as a smart card, having a central sheet supporting functional means, and bottom and top layers, characterised in that the said support sheet has at least one opening through which the two bottom and top layers communicate. In such an assembly, the material of the bottom and top layers has, with the material situated in the said opening, at least one homogeneous molecular continuity constituting one and the same material.

Other characteristics of the invention relate to the production and/or mounting of the functional elements (the power supply coil and antenna in the form of a winding, and the electronic block or chip), on a film made of dielectric material as a central support sheet, according to which, advantageously:

- the said winding is produced by metallisation of the said film;

- the chip is bonded to the said film, and its contacts are connected, advantageously by soldering, to two connection wires to the said winding, the assembly consisting of the chip and its connecting wires being embedded in a drop of resin;
- these two operations are performed continuously on the said film of dielectric material packaged for this purpose as a coil to be unwound continuously.

These characteristics and advantages of the invention, as well as others, will emerge more clearly from a reading of the following description, given in relation to the accompanying drawings, in which:

Fig. 1 is a schematic view in section illustrating in its principle an extrusion device used in one embodiment of the method according to the invention,

Figs. 2 and 3 are similar plan views of a portion of film intended to constitute the central core of a card manufactured according to the invention, and provided with the functional elements of the card, and

Fig. 4 is a schematic view in section of the detail fitting within a circle in Figs. 2 and 3, illustrating the mounting of the chip on the said central core and its connection to the winding with power supply coil and antenna functions.

Considering first of all Fig. 1, it illustrates, in the method of manufacturing according to the invention a contactless card, in the form of a device, the step of producing two bottom and top layers 2 and 3 covering a central core 1 provided in advance with the functional elements of the card which,

according to circumstances, can be located in variable positions thereon. The layers 2 and 3 protect the entire core 1 and its components and, as a general rule, are printed during a subsequent step of the method.

According to the invention, the two bottom and top layers 2 and 3 are produced by extrusion, directly on the core 1. In the example depicted, they are obtained simultaneously by the well-known technique of sheet extrusion, by making the core 1 equipped in advance with components pass through the die F of the extrusion device E.

To this end, the feed head T of the die F consists of a block in which there are formed a channel C for passage of the core 1, ending up at the entry to the die F, and two ducts A1 and A2 for bringing the material to be extruded emerging respectively at the bottom and top in the channel C, immediately upstream of the entry to the die F. In this way a laminate is obtained at the exit from the die F, where the thickness and appearance of the two extruded external layers 2 and 3 can be perfectly controlled in a manner known per se. In order to strengthen the connection between the extruded layers 2, 3 and the central core 1, the latter can be coated with an appropriate adhesive before passing through the extrusion device E.

In the drawing, the core 1 appears, packaged in the form of a coil B to be unwound continuously, with a view to a continuous supply to the extrusion device E and, consequently, a production at the discharge of a continuous strip of laminate which can as it stands undergo subsequent processing such as cooling and printing, the cards finally being formed only by cutting from this strip.

In practice, conventional materials for extrusion can be used, such as polyethylene terephthalate (PET) or polyvinyl chloride, etc, selected according to the materials making up the central core 1 and the functional elements of the cards to be produced.

Fig. 2 illustrates a prior step in the preferred embodiment of the method according to the invention, relating to the preparation of the central core 1, which appears here as a part of a film 10 wound on a coil such as B in Fig. 1.

On the film 10, there are formed successively the same circuit arrangements each corresponding to the functional equipment of a card, and including therefore a chip 5 and a winding 6 with the function of a power supply and antenna coil.

The winding 6 is advantageously produced in a conventional manner by metallisation of the dielectric constituting the film 10, either by chemical etching or lamination of the metal, or screen printing.

The mounting of the chip 5 on the film 10 is illustrated in Fig. 4: the chip 5 is first of all bonded to the film 10, and then its contacts are connected to the ends of the winding 6, notably by soldering at the end of the connecting wires 7. The whole of the chip 5 and its connecting wires 7 can then be embedded in a drop of resin 8. All these operations relating to the chip 5 and the winding 6 can therefore be carried out in line, very largely if not completely automated. In a simpler form, the winding 6 can form an integral part of the electronic unit 5, which reduces the mounting operation to the simple fixing thereof to the film 10.

In Fig. 2, there can also be seen on the film 10 a periphery 11 in fine dot and dash lines surrounding the functional assembly consisting of the chip 5 and the winding 6, and which indicates the cut which will be made finally to the format of the final product to be obtained. Notably in the case where the central core is completely embedded in the extruded material, the cut is advantageously made following a locating by detection of the means 5, 6 through the material (for example by radio, ultrasound, etc).

Fig. 3 is essentially identical to Fig. 2 and consequently contains the same reference signs for designating the same elements, except that in addition recesses 12 have been shown, provided in the film 10 at the location of each future card, before or after the arrangement of the equipment assemblies 5, 6. The recesses 12 are provided as a communication passage between the front and reverse sides of the film 10, which will therefore enable the extrusion material to be distributed without any break in continuity around the film, therefore constituting the surface layers 2 and 3 joined together in a monolithic fashion. By providing, in addition to a central recess, longitudinal and transverse recesses straddling the cutting periphery 11, it is possible to obtain a card body forming a quasi-continuous envelope, except at a minimal part of the periphery.

In addition to the advantages of the use of the manufacturing method emerging from the above description, the invention is also remarkable with regard to the product resulting therefrom, whose functional means are entirely protected in a plastic sheath, whose security is at a maximum since there can be no physical access to the electronic circuits without destroying the card body, and whose printable surface is increased.

CLAIMS

1. A method of manufacturing integrated circuit media of the contactless type, such as contactless smart cards, provided with functional elements comprising an electronic unit (5) connected to a winding (6) with an antenna function, and whose body comprises a covering layer on at least one side of the said functional elements, characterised in that the said functional means (5, 6) are located on a support sheet, and in that the said covering layer at least is formed by extrusion, immediately in contact with the said support sheet.
2. A method according to Claim 1, characterised in that the said support sheet is a conductive grille in which the said winding (6) is formed.
3. A method according to Claim 1 or 2, characterised in that it is implemented by making the said support sheet, provided in advance with the said functional means (5, 6), pass through a die (F) for extruding the said covering layer (2 and/or 3).
4. A method according to Claim 3, characterised in that the said support sheet, provided with the said functional elements (5, 6), is packaged in the form of a coil (B) to be unwound continuously with a view to continuous implementation of the extrusion step.
5. A method according to Claim 4, characterised in that, following the extrusion step and after cooling, a printing step and/or a step of cutting to the final format for the products to be obtained take place in line.

6. A method according to Claim 5, characterised in that it comprises a step of cutting the products to the final format in which there is provided, for the positioning necessary for the cutting proper, a prior locating phase by detection of the said functional means (5, 6) through the material with which they are covered.

7. A method according to one of Claims 4 to 6, characterised in that, following the extrusion step, a step takes place in line for the deposition of a printed film on the front and/or rear face of the products to be obtained.

8. A method according to one of Claims 1 and 3 to 7, characterised in that a film of dielectric material (1) is provided as a support sheet for the said functional elements (5, 6).

9. A method according to Claim 8, characterised in that two bottom (1) and top (2) layers are provided for covering the dielectric film (1) forming a central core between the two, and in that there are also provided one or more openings (12) in the said central core of the card, so that the said bottom and top (2, 3) layers are coextruded whilst being joined to each other in a monolithic fashion.

10. A method according to Claim 8 or 9, characterised in that, prior to the step of extruding the layers (2, 3), a winding (6) with antenna and supply coil functions for the chip (5) is produced by metallisation on the core (1).

11. A method according to Claim 10, characterised in that the chip (5) is bonded to the said central core, and its contacts are connected to two wires (7) for connection to the said

winding (6), the whole of the chip (5) and its connection wires (7) being embedded in a drop of resin (8).

12. A method according to Claim 11, characterised in that the two operations of producing the winding (6) and of mounting the chip (5) are carried out continuously on a film (10) packaged as a coil (B) to be unwound continuously and constituting the said central core.

13. An integrated circuit medium of the contactless type, such as a contactless smart card, obtained by the method according to one of Claims 1 to 12.

14. An integrated circuit medium of the contactless type, such as a contactless smart card, having a central sheet (1) for supporting the functional means (5, 6), and bottom and top layers (2, 3), characterised in that the said support sheet (1) has at least one opening (12) through which the two bottom (2) and top (3) layers communicate, the material of the bottom and top layers (2, 3) having, with the material situated in the said opening (12), at least a homogeneous molecular continuity constituting one and the same material.

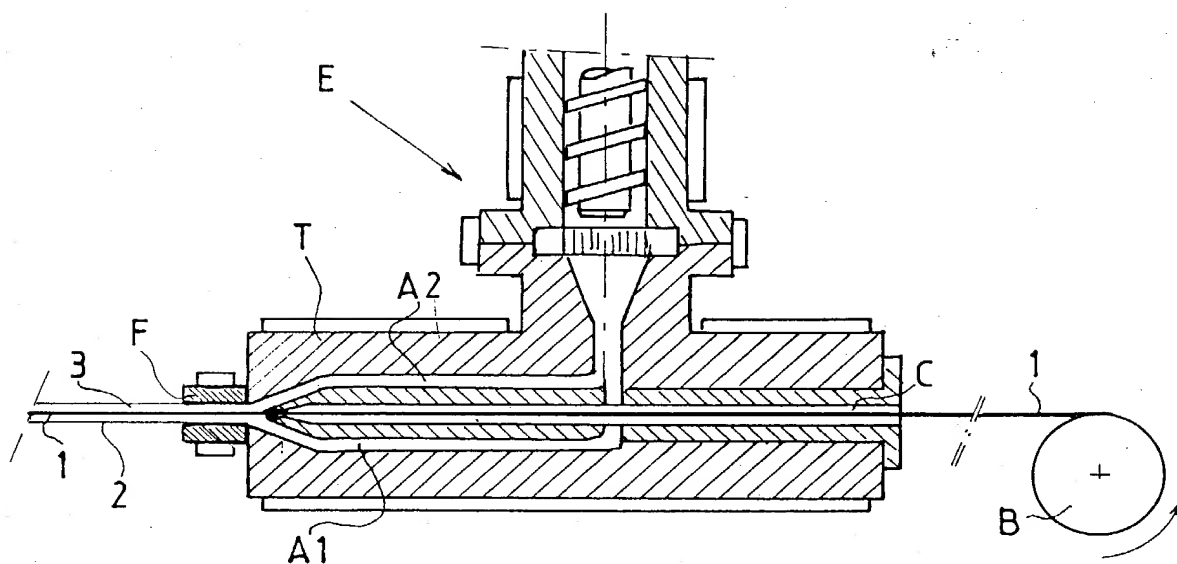


FIG. 1

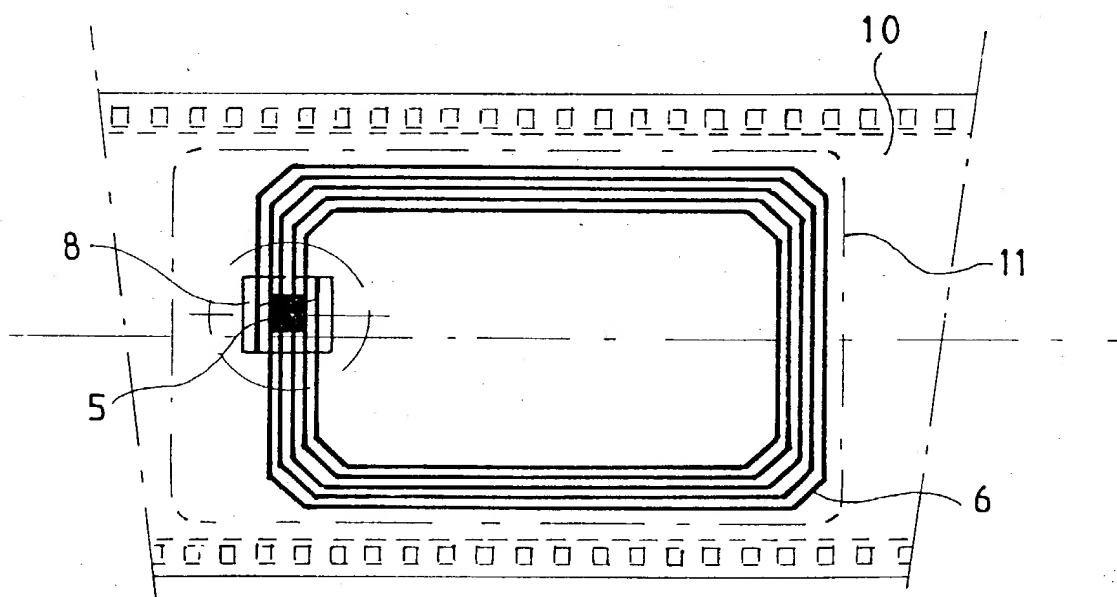


FIG. 2

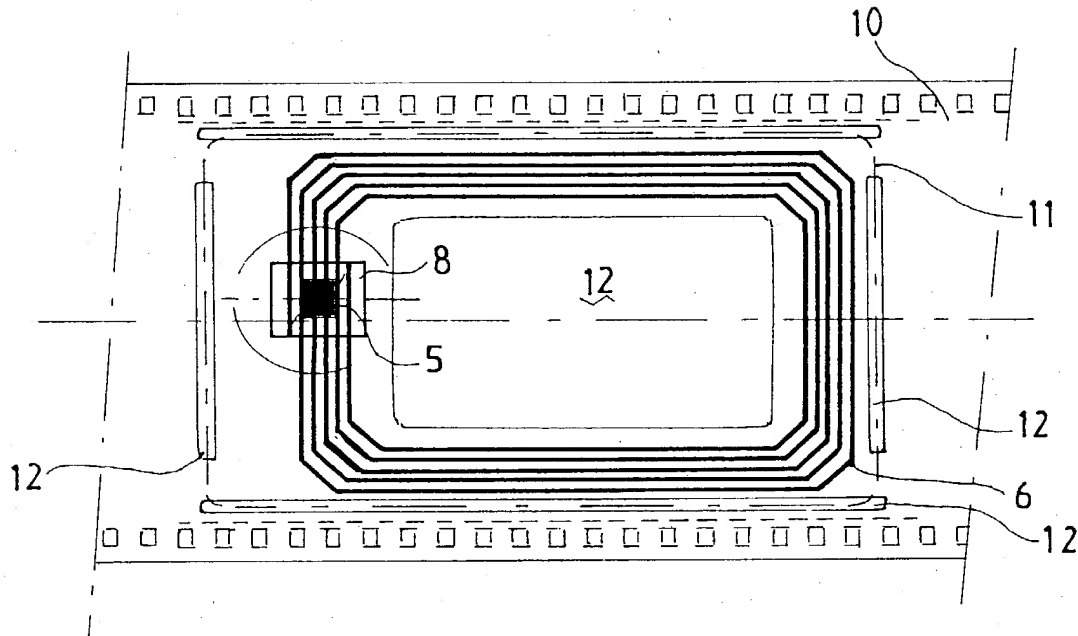


FIG. 3

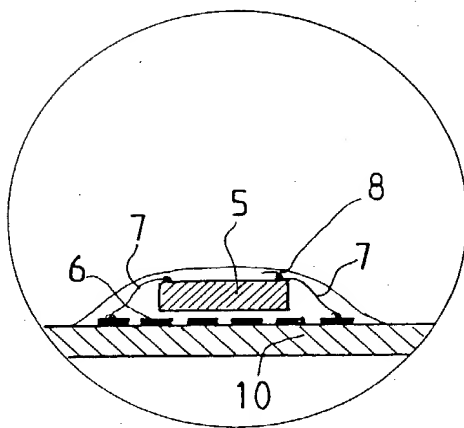


FIG. 4

Patent

Attorney's Docket No. 032326-170**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of)	
)	
Pierre BERTRAND)	Group Art Unit: Unassigned
)	
Application No.: 09/807,885)	Examiner: Unassigned
)	
Filed: November 13, 2001)	
)	
For: METHOD FOR PRODUCING A)	
CONTACTLESS CARD)	

DECLARATION OF EMILIEN MILHARO

I, the undersigned Emilien Milharo, hereby declare as follows:

1. I am employed by Gemplus, as a Patent Engineer in the Intellectual Property Department. At the time of the invention that is the subject of the above-identified application, I was responsible for all intellectual property matters in the area of technology to which the invention pertains. As part of this responsibility, I knew and worked directly with the inventor, Pierre Bertrand.


2. Attached as Exhibit A is a copy of an employment agreement that was signed by Pierre Bertrand on July 28, 1992. In the section of the agreement titled "Brevets et Inventions" (Patents and Inventions), he agreed to assign all inventions made during the course of his employment to Gemplus. An English translation of this section is attached as Exhibit B.

3. Following declaration of the Invention by Pierre Bertrand, there was assigned the reference number GEM 562, which is the Gemplus internal reference number that is used to identify the invention described and claimed in the above-identified application. I discussed the invention with Pierre Bertrand, and can confirm that it was made by him within the scope of his duties at Gemplus.

Page 2

4. Pierre Bertrand was continuously employed by Gemplus from the date on which he signed the employment agreement of Exhibit A until his resignation in calendar year 2000. Consequently, the invention referenced as GEM 562 was made while he was an employee of Gemplus.

I hereby declare that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true. Further, these statements are being made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001, and that any such willful false statements or the like may jeopardize the validity of the above-identified patent application and any patent issuing thereon.


Emilien Milharo
Patent Engineer, Gemplus IP Department

Date: July 10, 2002

COMBINED DECLARATION AND POWER OF ATTORNEY FOR UTILITY OR DESIGN PATENT APPLICATION

On behalf of, and as agent for the named inventor Pierre Bertrand, the applicant and assignee Gemplus hereby declares that:

The undersigned Bernard Nonnenmacher is the Director of Intellectual Property for Gemplus and entitled to sign this document on behalf of Gemplus;

The last-known residence, post office address and citizenship of the inventor are stated below next to his name;

It is believed that Pierre Bertrand is the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method for Producing a Contactless Card
--

the specification of which (check only one item below):

- ☐ is attached hereto.
- ☒ was filed as United States Patent application
Number 09/807,885 on 13 November, 2001
and was amended on _____ (if applicable).
- ☐ was filed as PCT International application
Number _____ on _____
and was amended on _____ (if applicable).

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

Gemplus hereby claims foreign priority benefits under Title 35, United States Code, §§ 119 (a)-(d), 172 or 365 of any foreign application(s) for patent or inventor's certificate or of any international (PCT) application(s) designating at least one country other than the United States of America listed below and has also identified below any foreign application(s) for patent or inventor's certificate or any PCT international (PCT) application(s) designating at least one country other than the United States of America filed on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §§ 119(a)-(d), 172 or 365:			
COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §§ 119, 172 or 365
France	99/06535	12 May 1999	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

**Combined Declaration and Power of Attorney
for Utility or Design Patent Application
Attorney's Docket No. 032326-170
Page 2 of 2**

Gemplus hereby appoints the following attorneys and agent(s) to prosecute said application and to transact all business in the U.S. Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

William L. Mathis	17,337	Eric H. Weisblatt	30,505	Bruce T. Wieder	33,815
Robert S. Swacker	19,885	James W. Peterson	26,057	Todd R. Walters	34,040
Platon N. Mandros	22,124	Teresa Stanek Rea	30,427	Ronni S. Jillions	31,979
Benton S. Duffett, Jr.	22,030	Robert E. Krebs	25,885	Harold R. Brown III	36,341
Norman H. Stepno	22,716	William C. Rowland	30,888	Allen R. Baum	36,086
Ronald L. Grudzicki	24,970	T. Gene Dillahunt	25,423	Brian P. O'Shaughnessy	32,747
Frederick G. Michaud, Jr.	26,003	Patrick C. Keane	32,858	Kenneth B. Leffler	36,075
Alan E. Kopecki	25,813	B. Jefferson Boggs, Jr.	32,344	Fred W. Hathaway	32,236
Regis E. Slutter	26,999	William H. Benz	25,952	Wendi L. Weinstein	34,456
Samuel C. Miller, III	27,360	Peter K. Skiff	31,917	Mary Ann Dillahunt	34,576
Robert G. Mukai	28,531	Richard J. McGrath	29,195	Donna M. Meuth	36,607
George A. Hovanec, Jr.	28,223	Matthew L. Schneider	32,814	Mark R. Kresloff	42,766
James A. LaBarre	28,632	Michael G. Savage	32,596		
E. Joseph Gess	28,510	Gerald F. Swiss	30,113		
R. Danny Huntington	27,903	Charles F. Wieland III	33,096		



21839

Address all correspondence to:

James LaBarre
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, Virginia 22313-1404



21839

Address all telephone calls to:

James LaBarre

at (703) 836-6620.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF INVENTOR	Pierre Bertrand
Residence (City, State, Country)	Cassis, France
Citizenship	France
Mailing Address	"La Caravelle", 13, rue Alexandre Rossat
City, State, ZIP, Country	F-13200 Cassis, France
APPLICANT, Gemplus, by	Bernard Nonnenmacher
Title	Director of Intellectual Property
Signature	<i>[Signature]</i>
Date	2 July 2002
Residence (City, State, Country) Mailing Address	Gemenos, France
Citizenship City, State, ZIP, Country	France
Mailing Address	Avenue du Pic de Bertagne
City, State, ZIP, Country	F-13881 Gemenos, France



GEMPLUS
CARD INTERNATIONAL

GEMPLUS CARD INTERNATIONAL
CONTRAT DE TRAVAIL A DUREE INDETERMINEE

MENSUEL

Entre : GEMPLUS CARD INTERNATIONAL
Parc d'activités de la plaine de Jouques
B.P. 100
13881 GEMENOS CEDEX

d'une part,

et : **Monsieur BERTRAND Pierre**

d'autre part,

[désigné(e) ci-après par les termes : Titulaire du présent contrat.]
Il a été convenu ce qui suit :

FONCTIONS - CLASSIFICATION - REMUNERATION

Le titulaire du présent contrat est engagé par GEMPLUS CARD INTERNATIONAL

à compter du : 03 Août 1992.
en qualité de : TECHNICIEN PROCEDE
catégorie : MENSUEL
classification : "Administratifs et techniciens"
niveau/échelon : Niveau IV / Echelon 2
coefficient : 270

Ses appointements se composent :

- d'un salaire mensuel sur 12 mois de : 8.500 Francs
- pour un horaire de présence hebdomadaire de : 39 heures.

TB

S.A. au capital de 36 395 700 F - RCS MARSEILLE B 319 111 200 - APE 2915 - Siège Social et Régional : Parc d'activités de la plaine de Jouques - 13420 GEMENOS
Adresse postale : B.P. 100 - 13881 GEMENOS CEDEX FRANCE - Tél. (33) 42.32.50.00 - Fax (33) 42.32.50.90

EXHIBIT A

- d'une gratification annuelle pour toute personne présente au 30 novembre et ayant 3 mois d'ancienneté, payable en décembre et représentant l'équivalent du salaire mensuel de base (hors primes et heures supplémentaires) de novembre. La gratification n'est due qu'au titre des périodes pendant lesquelles le salarié a été effectivement présent. Les absences réduisent, proportionnellement à leur durée, le montant de la gratification. La période de référence est celle du 1er décembre au 30 novembre.
- éventuellement d'une prime d'équipe et/ou d'une majoration week-end fonction de l'horaire de travail (cf : note sur l'organisation du travail). Leurs pourcentages sont en référence au minimum conventionnel de la catégorie, selon les accords en vigueur au sein de l'Etablissement. La prime conventionnelle de panier, lorsqu'elle est due, est incluse dans ces pourcentages.

CONDITIONS PARTICULIERES

1 - HORAIRES DE TRAVAIL

- L'horaire de travail du Titulaire du présent contrat sera :

Horaire N°0 (journée).

Il est entendu :

- qu'il pourra se transformer en tout autre système d'horaire et de rotation d'équipes déjà en service dans la Société, ou qui serait instauré sur la journée de 24 heures, sur la semaine ou sur le mois ou enfin qui serait mis en place dans la Société au titre de complément ou de modification du Règlement Intérieur, ainsi que dans le cadre des négociations annuelles sur l'aménagement du temps de travail et des dispositions légales en vigueur, et ce pour les besoins de l'organisation et des services, moyennant un délai de prévenance d'un mois.
- les modifications d'horaires seront portées à la connaissance du titulaire du présent contrat par une lettre précisant :
 - * le nouvel horaire
 - * la durée, si nécessaire, pendant laquelle le titulaire du présent contrat sera soumis à cet horaire
 - * les conditions particulières affectées à ce nouvel horaire.

Remarque : L'horaire de travail du titulaire du présent contrat, indiqué ci-dessus, n'empêchera pas le titulaire, suivant ces responsabilités et les nécessités du service de participer, au moins temporairement à d'autres horaires, et en particulier aux régimes d'astreinte et de permanence éventuellement nécessaires.

11.02.222 10.40 GEMPLUS CARD INT
09307395 1071202

2 - LIEU DE TRAVAIL

Le lieu de travail du Titulaire du présent contrat est présentement le principal Etablissement de GEMPLUS CARD INTERNATIONAL, Centre de Gémenos. Il est étendu à l'ensemble de la Région Provence - Alpes - Côte d'Azur.

Toutefois, GEMPLUS CARD INTERNATIONAL se réserve la faculté d'utiliser ses services dans tout autre établissement de la Société ou du groupe GEMPLUS, où il serait appelé par elle à exercer ses fonctions. De plus, le Titulaire accepte d'ores et déjà le principe d'une mutation éventuelle dans toute autre Société ou entité juridique membre du Groupe GEMPLUS, c'est-à-dire contrôlée, directement ou indirectement par la Société Holding GEMPLUS, sous réserve du maintien de ses droits acquis et de la reprise de son ancienneté. Il est entendu que toute mutation entraînant un changement de domicile ne pourra être effectué qu'avec l'accord du Titulaire du présent contrat.

3 - DEPLACEMENTS

Dans la mesure où ses fonctions le nécessiteraient, le Titulaire du présent contrat pourra être appelé à accomplir des déplacements de durée limitée, en France ou à l'étranger. Les frais engagés dans le cadre de ces missions seront remboursés suivant les règlements et usages en vigueur dans notre Société.

4 - DUREE DU CONTRAT

Le présent contrat, à durée indéterminée, ne deviendra définitif qu'après :

a) accomplissement satisfaisant d'une période d'essai dans notre Etablissement, avec possibilité de renouvellement,

* fixée à : 2 mois

* à compter du : 03 Août 1992.

b) examen médical légal à passer devant le médecin du travail de l'Etablissement en vue de constater l'aptitude du Titulaire du présent contrat à la fonction proposée,

c) dans le cas où la fonction du titulaire demande des habilitations particulières (défense...), agrément éventuellement exigé des services compétents des Administrations clientes à l'emploi par la fonction proposée du Titulaire du présent contrat.

Bertrand

TA

5 - SUSPENSION - RUPTURE DE LA PERIODE D'ESSAI

Dans le cas où l'une des parties serait amenée à interrompre la période d'essai, la durée d'interruption, s'il y a accord réciproque des parties, sera considérée comme une durée de suspension et la période d'essai sera prolongée de cette durée de suspension.

Pendant la première moitié de la période d'essai chaque partie pourra reprendre sa liberté à tout moment et ce, sans préavis.

Pendant la deuxième moitié de la période d'essai, le délai de préavis réciproque sera de 15 jours, sauf cas de force majeure ou de faute grave.

6 - FORMATION

La Société se réserve la possibilité de faire exécuter au Titulaire du présent contrat des stages de formation dans tout autre établissement de la Société ou du Groupe dont elle fait partie ainsi qu'en externe.

Une clause de dédit formation est prévue pour des stages de longue durée, dont les modalités seront précisées à chaque stage en fonction de la nature, de la durée, et coût de formation. Le Titulaire du présent contrat peut être redevable d'une somme égale au montant des frais de la formation si il démissionne pour toute raison autre que la maladie ou est licencié pour faute avant une période déterminée en rapport de la durée et du coût de la formation suivie.

CONDITIONS GENERALES

Le statut du Titulaire sera régi par le présent contrat. Sous réserve de dispositions plus favorables existant dans la Société, les conditions générales du présent contrat sont celles de la Convention Collective des mensuels des Industries Métallurgiques des Bouches-du-Rhône en vigueur pour la qualification de l'intéressé. Le Titulaire du présent contrat sera en outre affilié aux régimes de retraite complémentaire, mutuelle et prévoyance applicables à la Société.

Le Titulaire du présent contrat devra se conformer aux règles du Règlement Intérieur dont un exemplaire lui sera remis.

Il confirme être libre de tout engagement vis-à-vis de tout autre entreprise, toute fausse déclaration sur ce point l'exposant à des dommages-intérêts.

Pendant toute la durée du présent contrat, le titulaire s'engage à :

- a) N'accepter aucune autre fonction professionnelle rémunérée ou non et à ne s'intéresser à aucune autre affaire ou activité sans une autorisation expresse, spéciale et écrite de la Direction de GEMPLUS CARD INTERNATIONAL.



b) Respecter l'obligation qui lui est faite d'agir en toute circonstance au mieux des intérêts de notre Société, et de conserver le secret professionnel à l'égard des informations confidentielles dont il aurait connaissance à l'occasion ou par l'exercice de ses fonctions, et ce même après l'expiration du contrat de travail. Il doit notamment considérer comme strictement confidentielles toutes les informations recueillies par lui sur les technologies employées par la Société et informations commerciales ou autres relatives à ses marchés, ainsi que toutes informations qu'il pourrait connaître du fait de des activités professionnelles, dans quelque domaine que ce soit relatives aux technologies, logiciels, savoir-faire et informations économiques concernant tout le domaine d'activité des diverses Sociétés contrôlées directement ou indirectement par la Holding GEMPLUS.

c) Faire preuve, à l'égard des tiers, de toute la réserve et discrétion nécessaires en tout ce qui concerne les affaires de la Société et des autres entités du Groupe GEMPLUS.

d) S'abstenir de toute action susceptible de faire concurrence à la Société et aux autres entités du Groupe GEMPLUS, comme de tirer avantage à des fins personnelles ou extra-professionnelles de son appartenance à celui-ci.

e) Restituer lors de la cessation de son engagement tous les documents qui pourraient être en sa possession en raison de son emploi.

f) Ne faire paraître dans la presse écrite, radiodiffusée ou télévisée aucun article concernant le domaine des activités de la Société ou du Groupe dont elle fait partie, sans l'avoir soumis au préalable à l'approbation de la Direction de ladite Société.

g) Dans l'intérêt de la Société, rechercher de façon permanente les moyens propres à perfectionner et faire évoluer les procédés, méthodes, dispositifs, connaissances théoriques et pratiques, produits, le savoir-faire, etc... concernés par le cadre des activités de l'Unité ou Service auquel il appartient.

De même pour les études générales ou particulières qui sont confiées à cette Unité, soit seule, soit en collaboration avec d'autres Unités ou Filiales ou autres entités juridiques du Groupe GEMPLUS, ou avec des organismes extérieurs à la Société, et dans tous les domaines : techniques, industriels, économiques, administratifs... et quel que soit le poste occupé dans notre Société.

h) Faire connaître sans délai tous les changements qui interviendraient dans les situations qu'il a signalées lors de son embauche (adresse, situation de famille, situation militaire, etc..).

Bertrand

BREVETS ET INVENTIONS

Pendant la durée d'application du présent contrat, les inventions faites par le titulaire sont régies par la loi du 2 Janvier 1968 modifiée par la loi du 13 Juillet 1978 et les décrets d'application.

Les inventions répondant aux conditions fixées par l'article 1er Ter & 1 de la loi précitée appartient à la Société. Toutefois, celle-ci examinera, dans un esprit d'équité, l'éventualité de l'octroi à l'inventeur d'un avantage dont l'importance et la forme seront, en tous cas, laissées à la seule appréciation de la Société.

En conséquence, toutes les inventions brevetables, ou non, qui seraient réalisées par le titulaire du présent contrat, que ce soit dans le cadre de ses fonctions courantes ou celui d'une mission particulière dont il aurait été chargé, resteront la propriété de la Société. Il en serait de même des inventions mises au point par certains de ses collègues à la suite de ses propres études.

Par ailleurs, le titulaire du présent contrat ne doit pas utiliser, sans un accord écrit, les connaissances et le savoir-faire de la Société qu'il aurait acquis dans l'exécution de ses fonctions, non plus que les moyens matériels de la Société pour l'exécution d'études ou de recherches étrangères à l'objet du présent contrat et aux fonctions exercées dans la Société. D'une façon générale, toutes inventions brevetables ou non, susceptibles d'une application industrielle, ou dans tout autre domaine y compris celui se rapportant à un objet étranger pour application éventuelle en ce qui les concerne de la loi du 13 Juillet 1978 et du décret du 4 Septembre 1979 relatifs aux inventions du salariés.

Fait en double exemplaire.

A Gémenos, le 28 juillet 1992.

LE TITULAIRE DU PRÉSENT CONTRAT

BERTRAND Pierre

*Lu et approuvé. Reçu un original
du présent contrat.*

Bertrand

POUR LA SOCIÉTÉ

Aline CALVO
Direction Ressources Humaines

Le titulaire du présent contrat devra parapher chacune des pages précédentes.

En outre, sur la dernière page, il fera précéder sa signature de la mention manuscrite "Lu et approuvé. Reçu un original du présent contrat", pour accord définitif.

PATENTS AND INVENTIONS

For the duration of application of this contract, inventions made by the employee are governed by the law of January 2nd 1968, modified by the law of July 13th 1978 and decrees enforcing this law.

Inventions complying with conditions determined in article 1st Ter and 1 of the above mentioned law belong to the Company. However, the Company will consider fairly the possibility to give the inventor a benefit which extent and implementation will be at the sole assessment of the Company.

Consequently all inventions, patentable or not, made by the holder of this contract, either within his/her regular duties or a particular mission he/she is in charge of, will remain the property of the Company. Same rules apply for inventions made by some of his/her colleagues resulting from his/her own studies.

Moreover, the holder of this contract is neither allowed to use, without a written authorization, the knowledge and know-how of the Company that he/she has gained doing his/her job, nor the equipment of the Company for studies or researches irrelevant to the point of this contract and his/her function in the Company. Generally speaking all inventions, patentable or not, that can have an industrial use or concerning any other field including something extraneous that could be used would be subject to the law of July 13th 1978 and the decree of September 4th 1979 relating to inventions of employees.